REMARKS

Claims 1–2, 10, 11, and 16–30 are pending with claims 29–30 added by this paper.

Drawing Objection

Applicants are submitting herewith new drawings to remove the objections. Particularly, applicants have replaced French words with their English counterparts and replaced commas with decimal points. Consequently, Applicants respectfully submit that these objections should be withdrawn.

Abstract Objection

Applicants have deleted the previous Abstract and attached a new Abstract herewith. Consequently, Applicants respectfully submit that this objection should be withdrawn.

Claim Rejections Under 35 U.S.C. § 112, First Paragraph

Claims 1, 2, 10, 11, and 16–28 stand rejected as allegedly failing to comply with the enablement requirement and written description requirement. Applicants respectfully traverse these rejections.

With respect to the enablement requirement, Applicants respectfully submit that one of ordinary skill in the art would readily recognize how to use the composition of the present invention. Particularly, the first paragraph at page 1 discloses that the composition can be used as an adsorbent. Moreover, pages 1 and 2 also discuss an adsorbent disclosed in U.S. Patent No. 4,994,429. At column 3, line 67–column 4, line 38, several uses are provided for the material of that patent.

Similarly, one of skill in the art would readily recognize that the adsorbent of the present invention could be used similarly. Consequently, Applicants respectfully submit that these rejections should be withdrawn.

With respect to the allegation that there is no clear description of the term "amorphous," Applicants respectfully submit that one of skill in the art would readily recognize the meaning of the term amorphous. See attached definition of amorphous from *Hawleys Condensed Chemical Dictionary* (1997). Consequently, Applicants respectfully submit that this rejection should be withdrawn.

With respect to the allegation that the claims appear to require that the phosphate groups not be present in the material, yet each working example discloses the presence of phenyl phosphate groups, Applicants respectfully submit that this is a mischaracterization of the claimed invention. Particularly, the claimed invention defines a composition being essentially free of a phosphate, phosphonate or phosphinate phase of the element M. See, e.g., claim 1. At page 2 of the specification, the term "'essentially free of phosphate, phosphonate or phosphinate phase'" is defined as meaning that the number of phosphorous atoms present in any phase of the functionalized solid is less than 10%, usually less than 3% of the total number of phosphorous atoms present in the solid. Consequently, Applicants respectfully submit that there is no contradiction between the claims and the working examples of the present invention.

Thus, Applicants respectfully submit that these rejections should be withdrawn.

Claim Rejections Under 35 U.S.C. § 112, Second Paragraph

Claims 1, 2, 10, 11 and 16–28 stand rejected as allegedly being indefinite.

With respect to the rejections to claims 10, 11, 16, and 22, Applicants have made amendments at least substantively similar as suggested by the Action to remove these rejections. Consequently, Applicants respectfully submit that these rejections should be withdrawn.

With respect to the rejection to claim 1, Applicants have replaced the term "functionalized materials" with --composition--. However, the Examiner raises a concern that no positive recitation of the materials is provided by the claim, and similarly takes notice of the last two lines reciting what is not on the material.

First, Applicants respectfully submit that the claim does define a composition by positively reciting what is in the composition, e.g., an organic phosphorous-containing group bonded via an oxygen atom to a mineral oxide of at least one element M. What is more, there is nothing improper with the addition of negative limitations to define Applicants' claimed subject matter. See M.P.E.P. § 2173.05(i) at page 2100-214.

With respect to the allegations that the variable M is undefined other than it being an element, Applicants respectfully submit M must be capable of forming a mineral oxide and that this definition is sufficient to permit one of ordinary skill in the art to ascertain the metes and bounds of the claimed invention.

With respect to the structure of the claimed invention, Applicants respectfully submit that it is clear that the organic phosphorous-containing groups are bonded via an oxygen atom to a mineral oxide of at least one element M. See, e.g., claim 1 and the last paragraph beginning at page 2 of the specification.

With respect to the term "mineral oxide", the allegation in the Action is itself inconsistent. Particularly, the Action admits that the term "mineral oxide" <u>often</u> contains oxide oxygen entities.

However, it would also follow that sometimes a mineral would not contain oxygen entities, e.g., NaCl. Consequently, it is perfectly acceptable for Applicants to define their invention as a mineral oxide to specify that it is a mineral containing oxygen entities.

With respect to claim 2, Applicants respectfully submit that one of ordinary skill in the art would readily understand the term "distanced" means that the sulphur atom and phosphorous atom are separated, e.g., by a hydrocarbon chain. See, e.g., page 3, lines 4–7. Consequently, Applicants respectfully submit that one of ordinary skill in the art would readily understand the metes and bounds of the term "distanced."

With respect to the allegation that the variable l is not defined in claims 18 and 19, Applicants respectfully submit that this is not a variable letter l, but a number 1 (one). Consequently, Applicants respectfully submit that there is no ambiguity.

With respect the allegation that it is not clear that the hydrocarbon chain of 1–24 atoms is the same as the monomolecular layer, Applicants have amended claim 20 to provide further clarification. See also the third full paragraph on page 4 underneath, "Examples of Phosphorous-Containing Groups." Thus, Applicants respectfully submit there is no ambiguity.

In summary, Applicants respectfully submit that these rejections should be withdrawn. Furthermore, these and other amendments (except for specifying the element M and phosphorous ratio in claim 1) are made for clarification and do not narrow the claims. Nevertheless, if the Examiner demands alternative language, applicants would be interested in receiving any suggestions.

Claim Rejections Under 35 U.S.C. § 102

Claims 1, 2, 10, 11 and 16 - 28 stand rejected as allegedly being anticipated by U.S. Patent No. 6,139,752 (Lindoy). Applicants respectfully traverse these rejections.

Particularly, Lindoy fails to teach an essentially monomolecular layer of an organic group bonded to a mineral oxide via an oxygen atom of the mineral oxide. Rather, a phosphonic acid or phosphonic acid ester group is linked by a silicon atom. See, e.g., formula (1), at lines 1–5 of column 2.

Claims 1, 2, 10, 11 and 16–28 stand rejected as allegedly being unpatentable over U.S. Patent No. 4,994,429 (Wieserman). Applicants respectfully traverse these rejections.

Although Wieserman discloses that an unreacted acid group can be a sulphonic acid at column 6, lines 38–40, only Example II at column 12 utilizes an active material in which the unreacted acid group comprises a sulphur atom. This Example II is reproduced as a comparative example in the present specification. See Comparative Example 5, at page 10 of the present specification. In that example, the product has an Al/P mole ratio of 203.8. Thus, Wieserman fails to teach a ratio of the element M to phosphorous of about 15:1–200:1, and thus, fails to teach the present invention.

Thus, these rejections should be withdrawn.

In view of the above remarks, favorable reconsideration is courteously requested. If there are any remaining issues which can be expedited by a telephone conference, the Examiner is courteously invited to telephone counsel at the number indicated below.

The Commissioner is hereby authorized to charge any fees associated with this response or credit any overpayment to Deposit Account No. 13-3402.

Respectfully submitted,

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Hawley's

Condensed Chemical

Dictionary

THIRTEENTH EDITION

Revised by

Richard J. Lewis, Sr.

CERTIFICATION OF MAILING

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Derivation: By boiling an aqueous solution of ammonium cyanide with sulfur or polysulfides, or by the reaction of ammonia and carbon disulfide.
Grade: Technical, CP, 50–60% solution.
Use: Analytical chemistry; chemicals (thiourea); fertilizers; photography; ingredients of freezing solutions, especially liquid rocket propellants; fabric dyeing; zinc coating; weed killer and defoliant; adhesives; curing resins; pickling iron and steel; electroplating; temporary soil sterilizer; polymerization catalyst; separator of zirconium and hafnium, and of gold and iron.

ammonium thioglycolate. $HSCH_2COONH_4$.
Properties: Colorless liquid; repulsive odor. Evolves hydrogen sulfide. Combustible.
Use: Solutions of various strengths are used for hair waving and for hair removal.

ammonium thiosulfate.
CAS: 7783-18-8. $(NH_4)_2S_2O_3$.
Properties: White crystals decomposed by heat. PH of 60% solution 6.5–7.0. Very soluble in water.
Grade: Pure crystals (97%), 60% photographic solution.
Use: Photographic fixing agent, especially for rapid development; analytical reagent; fungicide; reducing agent; brightener in silver plating baths; cleaning compounds for zinc-base die-cast metals; hair waving preparations; fog screens.

ammonium titanium oxalate. (titanium ammonium oxalate). $(NH_3)_2TiO(C_2O_4)_2$.
Properties: A water-soluble powder
Use: Mordant in dyeing cellulosic fibers, leather, etc.

ammonium tungstate. (ammonium wolframate; ammonium paratungstate). $(NH_4)_6W_7O_{24}{\cdot}6H_2O$.
Properties: White crystals. Soluble in water; insoluble in alcohol.
Derivation: Interaction of ammonium hydroxide and tungstic acid with subsequent crystallization.
Use: Preparation of ammonium phosphotungstate and tungsten alloys.
See ammonium metatungstate.

ammonium valerate. (pentanoic acid, ammonium salt; valeric acid, ammonium salt). $C_5H_{13}NO_2$.
Properties: Very hygroscopic crystals. Mp 108C, mw 119.16. Very soluble in water, alcohol, and ether.
Grade: Food and flavor codex.
Use: Flavoring material.

ammonium vanadate. See ammonium metavanadate.

ammonium wolframate. See ammonium tungstate.

ammonium zirconifluoride. See zirconium ammonium fluoride.

ammonium zirconyl carbonate.
$(NH_4)_3ZrOH(CO_3)_3{\cdot}2H_2O$. D 1.238 (24C). Stable up to approximately 68C; decomposes in dilute acids, alkalies.
Grade: Aqueous solution.
Use: Ingredient in water repellents for paper and textiles, catalyst, stabilizer in latex emulsion paints, ingredient in floor wax to aid in resistance to detergents, lubricant in fabrication of glass fibers.

ammonobasic mercuric chloride. See mercury, ammoniated.

ammonolysis. The procedure that is analogous to hydrolysis, with ammonia substituted for water.

"Ammo-Phos" ***[Olin].*** TM for high-analysis ammonium phosphate-containing fertilizers.

amniote egg. The type of egg laid by reptiles and birds, having a nutritious yolk and a hard outer shell to protect the embryo from the dry environment. The amniote egg is named for the amnion, a sac that contains the embryo.

amobarbital. (5-ethyl-5-isoamylbarbituric acid). $C_{11}N_{18}N_2O_3$.
Properties: White, crystalline powder; odorless; bitter taste. Mp 156–161C. Solutions are acid to litmus. Very slightly soluble in water; soluble in alcohol.
Grade: USP.
Hazard: May be a habit-forming drug of abuse.
Use: Medicine (also as sodium salt), hypnotic.

amodiaquine hydrochloride.
$C_{20}H_{22}ON_3Cl{\cdot}2HCl{\cdot}2H_2O$.
Properties: Yellow crystalline solid; odorless; bitter. Mp 150–160C (decomposes). Soluble in water; sparingly soluble in alcohol; very slightly soluble in benzene, chloroform, and ether; pH (1% solution) 4.0–4.8.
Grade: NF.
Use: Medicine (antimalarial).

amorphous. Noncrystalline, having no molecular lattice structure, which is characteristic of the solid state. All liquids are amorphous. Some materials that are apparently solid, such as glasses, or semisolid, such as some high polymers, rubber, and sulfur allotropes, also lack a definite crystal structure and a well-defined melting point. They are considered high-viscosity liquids. The cellulose molecule contains amorphous as well as crystalline areas. Carbon derived by thermal decomposition or partial combustion of coal, petroleum, and wood is amorphous (coke, carbon black, charcoal), though other forms (diamond, graphite) are crystalline. Amorphous metallic alloys for transformer coils are made by extremely rapid cooling of the molten mixture. They are composed of iron, nickel, phosphorus, and boron.
See liquid; liquid crystal; glass, metallic.